Cairo University- Faculty of Engineering
Computer Engineering Department
Communications Engineering – Fall 2022

Project

It is required to modulate three speech signals using the following scheme:

and then perform synchronous demodulation.

Select reasonable values for and any required parameters.

1) Obtain the modulated signal. Plot it in time domain. Plot its magnitude spectrum.
2) Perform synchronous demodulation to restore the three signals.
3) Perform demodulation three times with phase shifts of 10, 30, 90 degrees for both carriers.
4) For , perform demodulation two times with a local carrier frequency that is different by 2 Hz and 10 Hz from its carrier frequency.

Comment on the demodulated speech signals in (2), (3) and (4)

Deliverables:

1. One **uncompressed pdf** project report containing:
    a. Explanation of your work.
    b. All the required results and answers to questions.
    c. All the required figures. Label your figures properly.
    d. All the codes, included at the end.
2. One zip file containing all the codes and audio files.

Instructions:

- You can work in teams up to 2 members per team.
- Any copied results or codes will result in zero grade for both teams.
- Code in the report should be supplied as text, not as screenshots.

Due date: December 30, 2022, at 11:59 pm.